CLAIMS

1. A method of preparing substantially purified DNA, without the use of nucleases or proteases, by adding an effective amount of a compaction agent to a lysate to precipitate, from said lysate, DNA having a content of RNA of less than 3% by weight.

2. A method for the production of purified DNA having a content of RNA of less than about 3% by weight, comprising in combination the following steps:

A. lysing a cell mass to liberate the nucleic acids

B. optionally precipitating some additional moieties.

C. optionally adjusting the ionic strength and/or plasmid concentration and;

D. precipitating a substantial fraction of the DNA away from contaminating RNA and protein by addition of an effective amount of a compaction agent.

3. A composition of matter comprising DNA, substantially free of added nucleases, and containing less than about 3% by weight RNA

4. A method of treatment of a mixture comprising desired RNA product and contaminating DNA comprising mechanical lysis of the mixture in the presence of a compaction agent to precipitate at least a portion of the contaminating DNA.

5. A composition of Claim 3 comprising a plasmid DNA encoding proteins for use as a vaccine.

6. A method for making a biochemical assay comprising hybridizing a labeled probe to a target and thereafter precipitating the probe and the target, leaving the unhybridized probe substantially in solution.

7. A method according to Claim 2 for producing ribosomal RNA, chromosomal DNA, plasmid DNA, aptamers, artificial RNA, or mRNA or other natural or synthetic nucleic acids.

8. The method of Claim 1 in which the addition of the compaction agent comprises the addition of two or more different mixed compaction agents whereby improved separation efficiency results.

. 9. A method according to Claim 1 additionally comprising stripping the compaction agent by a stripping method selected from the group comprising high salt addition and/or a pH shift.

10. A composition for the recovery of DNA comprising a mixture of combined reagents, one of which lyses and one of which precipitates DNA to clarify a cell mass.

11. A method according to Claim 2 additionally comprising a technique selected from the group consisting of: use of French cell press, addition of nonionic detergent, lysozyme addition, microfluidizer, freeze-thaw or any other relatively low ionic strength lysis technique to produce nucleic acid free lysates for later protein recovery.

12. A method according to Claim 1 comprising simultaneous application of the method in parallel mini-prep procedures for a plurality of cell masses.

13. A method of assay comprising precipitating a labeled probe while it is hybridized to a target.

14. A method according to Claim 2 additionally comprising a further separation step comprising one or more techniques selected from the group consisting of: precipitation and resuspension, filtration and adsorptionfor production of more pure product.

15. A method according to Claim 2 comprising addition of about 0.001 to 20 mM of a compaction agent selected from the group consisting of: basic polypeptides, polyamines, trivalent and tetravalent metal ions, or manganese chloride.

16. The method of Claim 2 wherein the source of the lysate comprises gram-positive bacteria, yeast, eukaryotes, synthesized nucleic acids, Archaea, bacteria, protozoa, phages, other viruses, human cells, body fluids, mixtures of cells, tissues, or environmental samples.

17.A method of performing a bioassay or separation comprising compaction precipitation, wherein a tagged probe (e.g. a fluoresceinated probe) is added to a solution containing its target, a double stranded nucleic acid is formed and this new structured hybrid nucleic acid is then selectively precipitated while the unhybridized single stranded probe is substantially left in solution.

18. A composition of Claim 3 comprising less than 0.1 Units endotoxin per microgram plasmid DNA (EU/ug or IE/ug).

Sub B3

19. A biotech kit comprising compaction agent and other reagents and apparatus designed for the purification of nucleic acids from lysates or synthetic solutions.

20. Each invention described herein.

Add B4

ADD C4

Table A

Parameter	Units	Preferred	Most Pref.
Cell Mass		Archaea eukaryotes bacterial,Gram-negative Gram-positive phage, yeast	Gram-neg
Product:		DNA,RNA, Assay NA-binding protein enzymes,cosmids, YACs, Plasmid	plasmid DNA
Compaction Agent:		basic polypeptides (e.g. polylysine) , polyamines (e.g. protamine, spermidine, spermine, putrescine, cadaverine, etc.), trivalent and tetravalent metal ions (e.g. hexammine cobalt, chloropentammine cobalt, chromium (III)), netropsin, distamycin, lexitropans, DAPI (4',6 diamino 2-phenylindol), berenil, pentamidine, manganese chloride. Most preferred: hexammine cobalt, spermine and spermidine	
CA Conc. mM		0.02-20	0.05-10

Lysing Agent: detergent		**nonionic det.**	**BPER for RNA;**
	(alkaline lysis is m.p. for plasmidDNA)		
" " Conc.:wt%		**0.5-2**	**.05-.5**
pH:	**varies**	**6-8**	**7**
Ionic Strength:mM		**0-200**	**0-50**
(Before Compaction)			
Endotoxin Level		**>0.3 EU/mL**	**>0.1 EU/mL**